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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|------------------------------------|------------------|
| 10/693,276 | 10/23/2003 | Mustafa Pinarbasi | IBM1P088/SJO920000063US2 | 2354 |
| 50548 | 7590 | 07/26/2006 | | |
| ZILKA-KOTAB, PC P.O. BOX 721120 SAN JOSE, CA 95172-1120 | | | EXAMINER MCDONALD, RODNEY GLENN | |
| | | | ART UNIT 1753 | PAPER NUMBER |
| DATE MAILED: 07/26/2006 | | | | |

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/693,276

Applicant(s)

PINARBASI, MUSTAFA

Examiner

Rodney G. McDonald

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1753

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 May 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 8, 9 and 10 are rejected under 35 U.S.C. 102(e) as being anticipated by Sato et al. (U.S. Pat. 5,986,858).

Regarding claims 1, 9, Sato et al. teach making GMR magnetic sensors such as spin valve magnetic sensors. (Column 1 lines 65-68) In Fig. 15 Sato et al. teach depositing a first ferromagnetic layer 42B of Co having a first surface on a substrate. Depositing a spacer layer 40C comprising a metallic aluminum layer having a second surface. Depositing a second ferromagnetic layer 43A. The spacer layer is disposed between the first and second ferromagnetic layers. On the surface of the first ferromagnetic layer 42B and the second surface of the spacer layer Al an oxide layer is formed by natural oxidation, thermal oxidation or plasma oxidation. The first ferromagnetic layer 42B of Co is formed by sputtering and then exposed to oxygen to produce a CoO_x layer 42C. (This is the exposing of the first surface to an oxygen partial pressure). After that the aluminum film (Fig. 15) is formed by sputtering (This is decreasing the oxygen partial pressure to zero to deposit the metallic Al layer) and then

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exposed to oxygen to form an AlO_x layer (This is the exposing of the second surface to an oxygen partial pressure). After that the second ferromagnetic layer 43A of Co is formed (This is decreasing the oxygen partial pressure to zero to deposit the second ferromagnetic layer). After that a ferromagnetic layer 43B is deposited. (Column 13 lines 62-68; Column 14 lines 1-46)

Regarding claims 8, 10, as discussed above the oxygen is stopped before depositing the subsequent layers. (Column 13 lines 62-68; Column 14 lines 1-46)

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sato et al. (U.S. Pat. 5,986,858) in view of Pinarbasi (U.S. Pat. 5,871,622).

Sato et al. is discussed above and all is applies as above. (See Sato et al. discussed above)

The difference between Sato et al. and the present claims is that ion beam sputtering for forming the layers is not discussed (Claim 6) and the use of a shutter for exposing the surface to oxygen is not discussed (Claim 7).

Regarding claim 6, Sato et al. teach utilizing ion beam sputtering for forming the layers of a spin valve magnetoresistance head. (See Abstract)

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Regarding claim 7, Pinarabasi teach in Fig. 1 an ion beam sputtering device having a shutter 106. (See Fig. 1) Having the shutter 106 open to expose the substrate would be obvious since Sato et al. require the entire surface be oxidized.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Sato et al. by utilizing ion beam sputtering and a shutter in an ion beam device as taught by Pinarabasi because it allows for oxidizing the entire surface.

Claims 2-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sato et al. (U.S. Pat. 5,986,858) in view of Deguchi et al. (U.S. Pat. 5,862,021).

Sato et al. is discussed above and all is applies above. (See Sato et al. discussed above)

The difference between Sato et al. and the present claims is that the oxygen partial pressure is not discussed.

Regarding claim 2, Deguchi et al. teach that the oxide layers can be formed by a natural oxidation process, thermal oxidation process or a plasma oxidation process. (See Sato et al. discussed above) Deguchi et al. teach that instead of a natural oxide process to form an oxide film (Column 5 lines 28-32) that a cobalt oxide layer can be formed by sputtering in the presence of Ar and O₂ at 3 mTorr. The partial pressure of the oxygen can range from 2.5×10^{-5} Torr to 3.0×10^{-5} Torr when the total gas pressure is 3 mTorr. (Column 9 lines 29-44)

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Regarding claim 3, as discussed above sputtering the metal films and either oxygen treating or sputtering in oxygen would result in decreasing the oxygen level to zero before depositing the subsequent layers. (See Sato et al. discussed above)

Regarding claim 4, in Sato et al. the first surface is exposed to an oxygen partial pressure before depositing the aluminum spacer layer. (See Sato et al. discussed above)

Regarding claim 5, in Sato et al. the second surface is exposed to an oxygen partial pressure before depositing the second ferromagnetic layer. (See Sato et al. discussed above)

The motivation for utilizing oxygen at a particular partial pressure to form the layer is that it allows for controlling the coercive force. (Column 9 lines 29-44)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Sato et al. by utilizing a particular partial pressure for oxygen as taught by Deguchi et al. because it allows for controlling coercive force of the films.

Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sato et al. in view of Deguchi et al. as applied to claims 2-5 above, and further in view of Pinarbasi (U.S. Pat. 5,871,622).

The difference between Sato et al. and the present claims is that ion beam sputtering for forming the layers is not discussed (Claim 11) and the use of a shutter for exposing the surface to oxygen is not discussed (Claim 12).

Regarding claim 11, Sato et al. teach utilizing ion beam sputtering for forming the layers of a spin valve magnetoresistance head. (See Abstract)

Regarding claim 12, Pinarabasi teach in Fig. 1 an ion beam sputtering device having a shutter 106. (See Fig. 1) Having the shutter 106 open to expose the substrate would be obvious since Sato et al. require the entire surface be oxidized.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Sato et al. by utilizing ion beam sputtering and a shutter in an ion beam device as taught by Pinarabasi because it allows for oxidizing the entire surface.

Response to Arguments

Applicant's arguments filed May 12, 2006 have been fully considered.

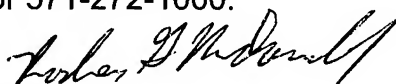
Applicant has filed a 37 CFR 1.131 declaration establishing invention of the subject matter prior to the effective date of Sakakima. However newly cited reference to Sato et al. teach the claimed subject matter as discussed above. The effective date of Sato et al. is March 24, 1998 which predates Applicant's date of October 4, 1998. Sato teach depositing the required layers with the oxidizing steps. The decrease in oxygen occurs because the layers deposited after the oxide layers require depositing metallic layers and no oxygen in those metallic layers. Since Sato et al. is a newly cited reference this action will be made NON-Final.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rodney G. McDonald whose telephone number is 571-272-1340. The examiner can normally be reached on M- Th with Every other Friday off.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X. Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Rodney G. McDonald
Primary Examiner
Art Unit 1753

RM
July 20, 2006